STATE OF OKLAHOMA'S RESPONSE IN OPPOSITION TO PETERSON FARMS, INC.'S MOTION IN LIMINE REGARDING FORMER EMPLOYEES (Dkt. #2395)

EXHIBIT 9

Poultry Water Quality Handbook

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The Water Quality Consortium

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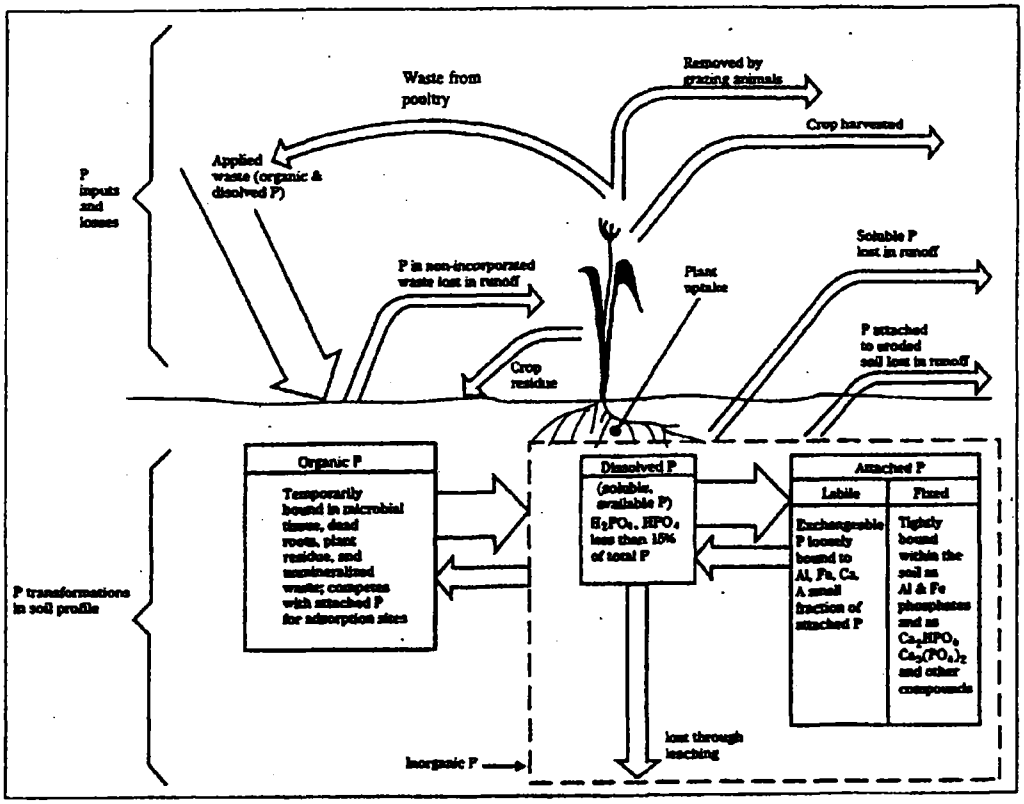

Figure 2.—Abbreviated phosphorus cycle.

Losses of nitrogen regardless of source (e.g., manure, commercial fertilizer, or municipal biosolids) from the cropping system can occur as a result of volatilization, surface runoff, and leaching. Surface runoff can move dissolved nitrogen (especially nitrate), ammonium nitrogen attached to eroding soil particles, and organic nitrogen contained in organic or plant residues into streams and lakes. Nitrates also move with the soil or leach through well-drained soils past the root zone into the groundwater supply.

High levels of nitrate can be toxic to human health, especially newborns. Nitrates reduce the blood's capacity to carry oxygen or cause internal suffocation. Scientists tell us that too much nitrate can affect the weight, feed conversion, and performance of poultry. Too much nitrogen in surface water makes the water less productive and may result in fish kills.

Phosphorus

Poultry wastes also contain significant amounts of phosphorus (see Fig. 2). Phosphorus, like nitrogen, is essential for plant and animal growth and also contributes to environmental problems. In fact, it seems to be the limiting factor in the huge algae blooms that make lakes unfit for swimming and ultimately deplete their oxygen supply, deadening the water and killing fish. Phosphorus has become a major cause of water quality degradation.

Phosphorus exists in either dissolved or solid form. Dissolved phosphorus usually exists as orthophosphates, inorganic polyphosphates, and organic phosphorus in the soil. Phosphorus in the solid form is referred to as particulate phosphorus and may be composed of many chemical forms. Particulate phosphorus comes in four classifications:

- adsorbed phosphorus, which attaches to soil particles;